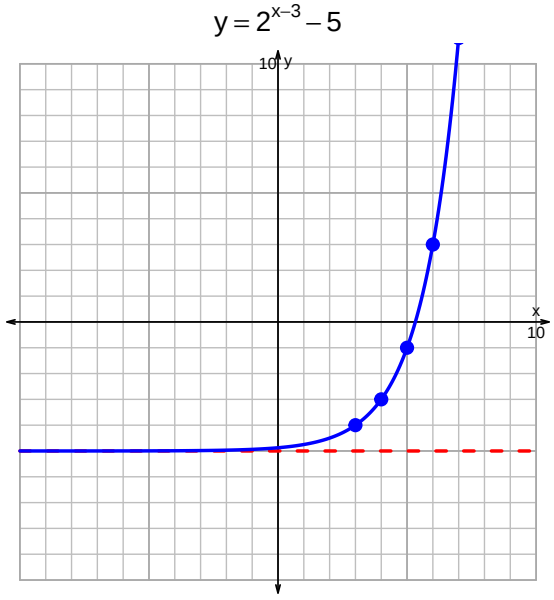
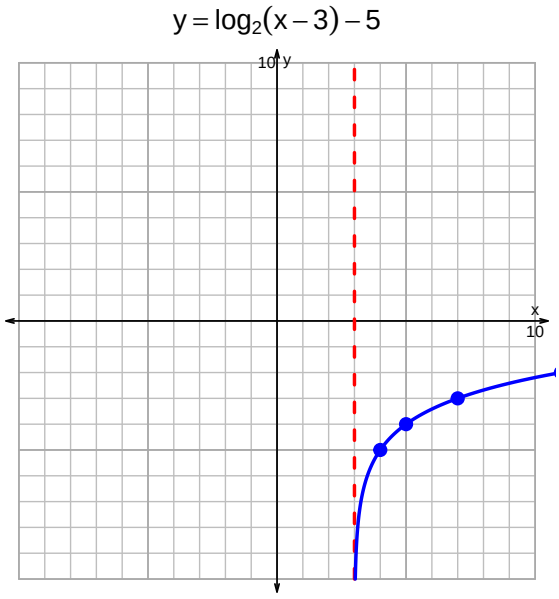
Name: Date:

s18quiz: EXP LOG (Solution v147)

1. Graph $y = 2^{x-3} - 5$ and $y = \log_2(x-3) - 5$ on the grids below. Also, draw any asymptotes with dotted lines.





2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-23 = \left(\frac{-3}{7}\right) \cdot 10^{4t/5}$$

Divide both sides by $\frac{-3}{7}$.

$$\frac{23 \cdot 7}{3} = 10^{4t/5}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{23 \cdot 7}{3}\right) = \frac{4t}{5}$$

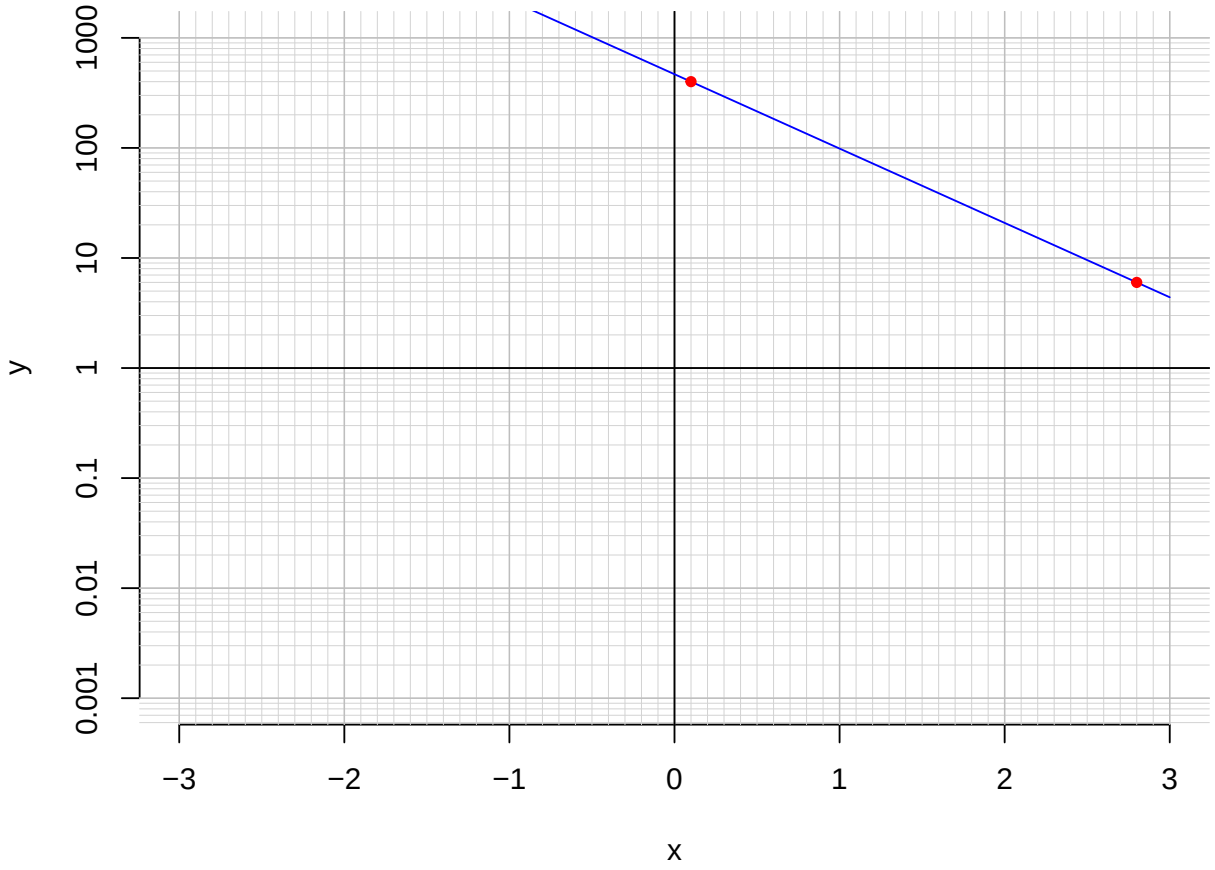
Divide both sides by $\frac{4}{5}$.

$$\frac{5}{4} \cdot \log_{10}\left(\frac{23 \cdot 7}{3}\right) = t$$

Switch sides.

$$t = \frac{5}{4} \cdot \log_{10}\left(\frac{23 \cdot 7}{3}\right)$$

3. An exponential function $f(x) = 467 \cdot e^{-1.56x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(2.8)$.

$$f(2.8) = 6$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{1.56} \cdot \ln\left(\frac{x}{467}\right)$$

c. Using the plot above, evaluate $f^{-1}(400)$.

$$f^{-1}(400) = 0.1$$